Before the
Federal Communications Commission
Washington, D.C. 20554

In the Matter of Improving Wireless
Emergency Alerts and
Community-Initiated Alerting

PS Docket No. 15-91

AC&C LLC REPLY COMMENTS

1. INTRODUCTION AND SUMMARY

Incorporating the intelligence and capabilities of mobile handsets into the WEA service is the simplest and most effective way to significantly improve the Nation's Wireless Emergency Alert (WEA) service. A multitude of Public Safety officials, academic studies, technology vendors, and the CSRIC V body, all agree that a handset or device-assisted upgrade is eminently doable and makes sense. The commitment by the Commission in the recent Order is a key first step. The work, however, is not completed. As Commissioner Pai stated in his statement to that Order, "After studying the record and speaking with public safety officials, including in New York City, I agreed that we need to do more than just codify the status quo. So I proposed that we be more forward leaning, that we commit in this Order to moving ahead with a device-based approach to geo-targeting. By enabling devices to screen emergency messages and only allow the relevant ones through, this approach would allow public safety officials to target information to specific geographic areas. And it would advance WEA as a platform by reducing "alert fatigue." AC&C agrees.

As AC&C has said throughout this proceeding, incorporating the intelligence of the device into the WEA service in a way that significantly improves geo-targeting while creating an opportunity for wireless providers to draw revenue from cell broadcast capabilities will stimulate continued investment and innovation in WEA, thereby providing an opportunity to future-proof the service.

While the launch of the WEA system in 2012 was the beginning of a new era for mass notification in this country, time has shown that the current system is limited in its efficacy for a number of reasons, most notably that alert-originators cannot confine their messaging to the area that they would like to alert.[1] As a result, the system has been underutilized. In the over four years

Incorporating the intelligence of the device into the WEA service in a way that significantly improves geo-targeting while creating an opportunity for wireless providers to draw revenue from cell broadcast capabilities will stimulate continued investment and innovation in WEA, future-proofing the service.

[1] : Boulder Regional Emergency Telephone Service Authority: "WEA is also of limited utility to local

since its inception, only forty-eight entities have sent alerts over the WEA system. In total, 622 out of over 6,500 have registered to deliver alerts.[2] And perhaps most telling, those 622 qualified alert originators pale in comparison to the 4,400 entities[3] who have invested in opt-in mass notification systems in an effort to meet their alert notification needs, but at the same time limit distribution of the alert to the originator's constituents.[4] The challenge of relying on opt-in systems is the reality that on average, only 3-5% of the population registers their device to receive the notifications. Compare this to WEA, which is designed to reach all devices across the country in all communities without signing up or requiring expensive and inaccurate databases.

If the WEA system is to become the center of an alert-ready nation, as it was intended, it must continue to evolve to meet the needs of both public safety and citizens. As Commissioner Pai, CSRIC V and numerous Public Safety officials in the record indicate, there is a solution that can solve a significant range of the issues raised in the comments, while providing wireless carries with a revenue opportunity that will help to ensure that the service evolves as more than just an unfunded mandate on wireless providers.

As discussed below, and throughout comments in the record, applying the current benefits of cell-broadcast delivery of alerts, and integrating the incredible intelligence of the mobile device, the WEA service will deliver on its amazing promise to keep America's citizens alert and aware in times of trouble.

2. THE RECORD IN THIS PROCEEDING CONTAINS AN UNUSUALLY-DIVERSE RANGE OF SUPPORT FOR DEVICE-ASSISTED GEO-TARGETING

a. Introduction

A multitude of comments throughout the record, and memorialized in the recently-completed CSRIC V effort, clearly express a need for a roadmap to improve the capabilities of the WEA system, specifically the need for the WEA system to more precisely geo-target and geo-fence notifications.[5] A review of the record from the

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public safety agencies because messages cannot be targeted to affected areas."

[2] IPAWS Filing NPRM dated: 1/6/2016.

[3] Hyper Reach NPRM filing dated 1/13/2016. "We estimate that almost 1,900 counties and more than 2,500 municipalities have access to such a MENS (commercial mass emergency notification service) system. Collectively, we believe these systems cover more than 80% of the US population."

[4] Nixel, another opt-in mass notification system, reports on their web site that their system is "relied on by over 8000 agencies, fire and police departments, schools, hospitals." "The Nixle engagement platform is relied on by over 8000 agencies, fire and police departments, schools, hospitals…" From the Nixle web site: http://www.nixle.com

[5] Indiana Dept of HS, California Gov Office of Emergency Services, Pinellas County FL Emergency Management, U.S. Geological Survey, APCO International, Nevada Office of Emergency Management, NOAA/National Weather Service, City of Houston Mayor Office of Public Safety and Homeland Security, New York City Emergency Management Dept., Brevard County, FL Emergency Management , Kansas Division of Emergency Management, Jefferson Parish Emergency Management, Fort Riley Emergency

Commission's previous NPRM through the recently-adopted Order suggests that significantly improving geo-targeting through adoption and incorporation of a device-assisted enhancement to WEA may be the single most important change to the service. This issue has been raised by Public Safety officials from coast to coast,[6] from large community to small,[7] and from Public Safety Associations to a military base.[8]

Additionally, a number of studies from academic institutions and technology companies suggest that a device-assisted upgrade not only is feasible, but also should not be a costly or time-consuming process. Perhaps most important, CSRIC V, comprised of numerous representatives from Public Safety, wireless carriers, technology providers, and more, adopted a recommendation specifically setting a timeframe for development and incorporation of a device-assisted enhancement to WEA.

b. Significant and Wide-Ranging Public Safety Support for Device-Based WEA

Perhaps the most important element of the recent WEA record is the diverse and wide-ranging Public Safety support for a device-based enhancement to WEA. Police, Fire, Emergency Management, and State/County/Community leaders all have weighed in with the FCC in support of a device-enhanced WEA upgrade. This is no more evident than in an October meeting with key Public Safety officials from New York City and Chairman Wheeler. In the meeting, leaders from the New York City Emergency Management Department, New York City Police Department, New York City Fire Department, and the New York City Department of Information Technology and Telecommunications, when discussing "device-assisted geotargeting, encouraged the Commission to adopt rules that improve geo-targeting to a level comparable with apps which leverage location-based services on today's smart phones. The City strongly believes that such enhancements will lead to increased adoption by public safety agencies, prevent warning fatigue by eliminating over alerting, and potentially open the door to other classes of alert originators (e.g., colleges and universities, public housing authorities, etc.)."

A SAMPLING OF PUBLIC SAFETY SUPPORT FOR DEVICE-ASSISTED GEO-TARGETING

- ***West Feliciana Parish Sheriff's Office, St. Francisville, Louisiana (Ralph A Ladnier, Captain)***

"I would like to take this opportunity to express my support for device assisted geo-targeting alerts as part of the wireless alert system. Having been on the activation end of many notifications, I am unable to recall any notification that would not have been greatly improved through the addition of this technology. It is increasingly difficult to accurately provide lifesaving information to only the individuals who really need it without creating undue stress and endangering others in surrounding areas. As recently

Management.
[6] Douglas County WA to Brevard County FL.
[7] New York City Emergency Management to Vail Police Dept and Vail Public Safety.
[8] APCO to Fort Riley Emergency Management.

> "I would like to take this opportunity to express my support for device assisted geo-targeting alerts as part of the wireless alert system. Having been on the activation end of many notifications, I am unable to recall any notification that would not have been greatly improved through the addition of this technology."

as a few months ago my agency used our notification system to provide our citizens important information due to the flooding in Louisiana. These are critical lifesaving systems and as public safety leaders we must take action to enhance our ability to inform the public when their lives are in danger."

- ***NOAA/National Weather Service (Michael E. Gerber, Program Analyst, Office of Dissemination, September 17 and 22, 2016)***

"In multiple filings to the Commission on Proceeding 15-91, the National Oceanic and Atmospheric Administration's National Weather Service urged the Commission to adopt rules for deployment of precise geographical targeting and a map showing the recipient's location along with the alert originator's defined threat area."

"The National Oceanic and Atmospheric Administration's (NOAA) National Weather Service (NWS) strongly believes that significant advances in weather-related warning capability, social science, wireless technology, and mobile device technology warrant the FCC's proposed changes in the September 29, 2016, Report and Order and Further Notice of Proposed Rulemaking for WEA. Thus, NWS supports the proposed changes. . . . Rendering the WEA on 100% of the cell phones inside the actual target area plus phones no more than .10 mile outside the actual alert area should qualify as a "match"."

- ***Harris County, Texas (Mark Sloan, Emergency Management Coordinator)***

"I write today to voice our concern that a device-assisted geo-targeting capability timeline and requirements were not included in the Commission's September 29th Wireless Emergency Alert (WEA) Report and Order . . . . I believe that more precise geo-targeting, enhanced by incorporating the intelligence in our handsets (and, we note, the kind that is used in countless Apps, like Uber, each day) will save lives. . . . The record is clear – device based solutions to improve granularity are feasible and should be moving forward on the same timeline as the other WEA upgrades."

> "I believe that more precise geo-targeting, enhanced by incorporating the intelligence in our handsets (and, we note, the kind that is used in countless Apps, like Uber, each day) will save lives.

- ***Seattle Office of Emergency Management (Barb Graff, September 22, 2016)***

Enabling more precise alerting is the single most important action the FCC can take to make WEA relevant for first responders in the City of Seattle. Currently, the smallest guaranteed delivery area is the county and consequently that is the smallest area to which an alert safely can be made. Seattle is 83 square miles while its surrounding county, King County, is 2,307 square miles. The City of Seattle doesn't use WEA because it doesn't want to issue alerts to the 96% of King County that is not the City of Seattle. The lack of precise targeting makes WEA useless for Seattle in all but the largest events.

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- ***City of New York Police Commissioner (James P. O'Neil, September 21, 2016)***

Detailing the police response to the September 17 terrorist attack in New York City, Police Commissioner O'Neil wrote to the FCC that "[w]hen a secondary device was, in fact, discovered on West 27th Street we needed to quickly alert the hundreds of people in nearby apartment to "shelter in place." NYPD turned to the NYC Emergency Management Department to get the message out . . . . A second message was issued once the NYPD Bomb Squad secured the package. While the intended message was only for one block of buildings, there have been reports that people far outside of the targeted area received the message. This lack of granularity is concerning – we do not want people opting out of the system because they receive messages that are not relevant to them."

"I strongly urge the Commission to adopt rules that . . . improve geo-targeting by leveraging the GPS capability built into today's mobile phones."

- ***City of New York Mayor's Office (Bill de Blasio, September 22, 2016)***

The WEA system needs to have improved geo-targeting capability so messages are delivered to the correct area with minimal overshoot or undershoot. Today's mobile phones have built in GPS technology that must be leveraged to improve accuracy."

- ***City and County of San Francisco Department of Emergency Management (Anne Kronenberg, Executive Director, September 22, 2016)***

"For those of us in the emergency management community we know the incredible reach WEA provides in disseminating alerts to the public. However, the system can be improved in numerous ways. . . . "Device Assisted Geotargeting – Wireless Emergency Alerts should be capable of being sent to a granular area using technology that already exists in each handset."

- ***Office of Emergency Management, Nassau County, NY (Craig Craft, Commissioner, September 22, 2016)***

"The Nassau County, New York, Office of Emergency Management is submitting this letter to advocate for the following Wireless Emergency Alerts (WEA) capabilities . . . . Device-Assisted Geo-targeting – Wireless Emergency Alerts should be capable of being sent to a granular area using technology that already exists in each handset."

- ***City of Houston, Mayor's Office of Public Safety and Homeland Security (Dennis Storemski, Director, September 22, 2016)***

"Device-Assisted Geo-targeting: One of the concerns that arises using WEA is the high likelihood of over-alerting within an area. We want to be able to push a message to a specific portion of our jurisdiction and allow for the provision of unique protective actions. In many situations, different protective actions may be required for different geographic segments of the population, Device-Assisted Geo-Targeting would allow us to better provide information to affected individual, while reducing undue concern in neighboring areas."

- ***City of Los Angeles, Emergency Management Department (Aram Sahakian, General Manager, September 22, 2016)***

"Our mission of situational awareness and being able to inform the public during times of emergencies, disasters and terrorist events means that we need all the most well-designed and technically capable system possible. . . . We need to be able to send out more precise messaging to areas which are directly impacted by an incident instead of being forced to include the wider general population. The lack of this capability causes confusion and discredits the use of messaging in this form."

- ***New York City Fire Department (Daniel A. Nigro, Fire Commissioner September 22, 2016)***

"The WEA system needs to have improved geo-targeting capability so messages are delivered to the correct area with minimal overshoot or undershoot. Today's mobile phones have built in GPS technology that must be leveraged to improve accuracy."

As we have learned time and again – including as recently as this past Saturday, when members of the FDNY and other agencies responded to a bombing in the Chelsea neighborhood and subsequently to other locations throughout the city in connection with the event – it is vital that the City is able to communicate with the public in an accurate and efficient manner. The WEA system is a key piece of the emergency public

information strategy, but the current system requires significant improvements in order to be truly effective."

- ***Government of the District of Columbia, Homeland Security and Emergency Management Agency (Chris T. Geldart, Director, September 22, 2016)***

"In the wake of the bombings in New York and New Jersey, as well as the heightened risk of similar events occurring in the District, it is HSEMA's position that WEAS csn become more effective at enhancing public safety . . . . "Device Assisted Geotargeting – Wireless Emergency Alerts should be capable of being sent to a granular area using technology that already exists in each handset."

- ***Boulder Regional Emergency Telephone Service Authority***

"WEA is also of limited utility to local public safety agencies because messages cannot be targeted to affected areas."

"…more narrowed geo-targeting of WEA messages would make the service more useful and avoid causing people to opt out of WEA and ENS,…"

- ***City of Austin HS and EM (R. Scott Swearengin)***

"Of all the issues in this NPRM, the issue of geo-targeting deserves the most careful attention by the Commission . . . . Being able to target messages to an area near a specific waterway is critical if WEAs are to be used for alerting."

- ***APCO International***

"APCO understands that the ability to geo-target wireless messages can be affected by network topology, geography, and radiofrequency behavior. But to be as clear as possible, geotargeting saves lives. Accordingly, APCO encourages the wireless industry to apply available wireless network and device technologies to target messages as precisely as possible.

- ***Nevada Office of Emergency Management (A Chapman)***

"CCOEM supports improvements to WEA geo-targeting of alerts, specifically to minimize problems of bleed-over."

- ***Ventura County Sheriff, EOC (Gil Zavlodaver)***

This is one major problem with the current configuration of WEA and a reason why alerting authorities are hesitant to use WEA. It is important to be able to send targeted messages to the public using polygon level messaging.

- ***Brevard County, Florida Emergency Management (Kimberly Prosser)***

"Accurate GEO-Coding is vital to reducing residents becoming desensitized to emergency information. . . . The increase in geo-coding measures gives emergency managers the ability to only inform those residents affected and in turn reduce citizens potentially becoming desensitized."

- ***Jefferson Parish Emergency Management (Robert Greene)***

"Having the ability to pin point one certain area would be a great benefit to reducing the alert fatigue, bleed-over, etc."

Public Safety officials from large city to small parish, north to south and east to west, all have called for a device-assisted enhancement to WEA that will improve geo-targeting, make the service more effective and more useful to alert originators, and ultimately save lives.

c. Telecom Industry Support for Device-Based WEA

Numerous telecom industry vendors and wireless carriers have filed in support of a device-based WEA service.

CommTec:
"Specifically, Public Safety requests the ability to determine geo-granularity based on the type of alert for target area within a city block. In order to achieve this level of specificity we recommend WEA leverage the location-based technology within mobile devices. With the device, WEA can significantly enhance alert accuracy down to sub cell sector level by using both network based and device based geo-targeting algorithms. A small team of 3-4 engineers working on a proof of concept for this solution determined that these changes can be done using existing WEA systems, standards, and devices and can provide a demonstration within 90 days."[9]

RX Networks: RX Networks is "a mobile positioning technology company that runs the world's leading source of GPS, GLONASS, BeiDou or Galileo real-time assistance data

[9] Comtech Hybrid Geo-Targeting White Paper filed September 12th, 2016

service used by mobile carriers across the globe [that provides] services to over 1 billion devices." "The purpose of the meeting was to discuss incorporating the location capabilities of the handset into the existing WEA service, and how that can, and should, be done in a way that does not burden the carriers' networks. … As part of the WEA service, alert originators could modulate accuracy versus latency, based on the type of emergency and the need to deliver the information immediately. The parties discussed the belief that using the mobile device for geo-location and confidence level will be the most efficient way to deliver the WEA message.[10]

BlueGrass Cellular Inc. and its affiliates:
…. Geo-targeting Alert Messages is feasible if a solution is embedded within the handset produced by manufacturers.[11]

CEASA
The Challenge: "We need to enhance the geo fencing of such messages and preserve sovereignty; while still keeping the solution entirely passive." The Proposal: " This proposal is that the WEA message is delivered to the phone via cell broadcast, the message is pushed over the existing API (see Appendix B) to an app on the smart phone and checks for an associated 'polygon' with this alert message."[12]

Art Botterell
"The following are personal comments offered on the basis on my experience as the former manager and operational director of an integrated public warning system in a major metropolitan area, as a system architect and consultant on public warning systems internationally, as a member of the CMSAAC, and as the original designer and proponent of the Common Alerting Protocol (CAP). "

…'This brings us to the question of "device-based solutions." By providing the actual bounds of the CAP alert area to a location-aware end device, we could make it possible for modern "location aware" smartphones to determine not only whether that device is in the target area, but also if any user-designated location of interest is affected. At a stroke we remove many of the complexities and costs of limiting transmission precisely by selecting cell sites or sectors. This leveraging of smartphones and other location-aware receiving devices was a key use-case in the design of the Common Alerting Protocol." [13]

d. Academic Studies Investigating and Supporting Device-Based WEA

As discussed, the issue of a device-based approach was addressed multiple times by academic institutions throughout the record. There are research studies from Carnegie Melon, Johns Hopkins University Applied Physics Lab', and the National Consortium for the Study of Terrorism and the Response to Terrorism (START) that address the

[10] RX Networks filing September 16, 2016
[11] Bluegrass Cellular, Inc and its Affiliates filing September 1, 2016
[12] CEASA Application Based enhancements to WEA filed August 3, 2016
[13] Art Botterell filing December 7, 2015

feasibility of a device-based enhancement to WEA.[14] Specifically, while not developed as part of this record, they address several of the issues raised in the record, in part through an ATIS Feasibility Study conducted by the wireless industry. That ATIS study discusses the need for additional research and standards required to integrate a device-based solution into the WEA system. The ATIS study also discusses the need for additional research and standards for using compression techniques to deliver polygon coordinates using cell broadcast, the reality that for mobile device geo-targeting to function, the mobile device must first determine its current location, which is not always possible, and the need for additional research and standards to determine the best use of displaying maps as part of an alert message. The ATIS study concludes "In summary, WEA is a voluntary service and there is no funding for enhancements."

Each of these issues have already been addressed in the research papers. DHS S&T has funded significant research that demonstrates feasible and practical solutions that overcome many of the technological obstacles discussed in the ATIS Study. In particular:

- Carnegie Melon's research has successfully demonstrated compression techniques that enable efficient transmission of polygons representing geographical targets using cell broadcast.
- Johns Hopkins University Applied Physics Lab's research shows that a device-based solution can improve the geo-targeting accuracy of WEA significantly without consuming excessive mobile device power or radio resources. Also, device can be programmed to display alert as a default when device is unable to determine its current location.
- The National Consortium for the Study of Terrorism and the Response to Terrorism (START) research has concluded in their first study that high-resolution maps had a statistically significant and positive effect on public response outcomes including interpretation and personalization, and, hence, could have a positive effect on protective action taking. In their second study they found that low-resolution static maps should not be used in WEA messages without further research examining the best way to craft such maps.

AC&C believes that the research contained in the studies confirms that a device-based solution not only is feasible, but also sensible. While work would need to be completed with the wireless carriers and handset manufacturers, the record suggests that this approach should strongly be considered.

e. Existing 3GPP Standards for Concatenation and Compression

A number of potentially necessary standards for the WEA upgrades under consideration already exist. For example, standards to expand WEA from 90 characters to 360 characters and to use compression to expand the capacity of the 360 characters already are in place. "3GPP TS 23.041 (Technical realization of CB Section 2.0 and 8.1 outlines

[14] AC&C filing February 12, 2016 Order of documents in filing: 1st START 2014, 3rd, Carnegie Mellon Small Polygon Compression, 4th, John Hopkins

how the device can accept up to 15 concatenated pages) and 3GPP TS 23.038 (CT1) (Alphabets and language specific information Section 5.5 CB Data Coding Scheme p 11) should be used to pass the coordinates from alert originators to the handset and to concatenate 4 pages (90 characters each) in order to achieve 360 characters. To further increase the amount of data (e.g. polygon coordinates) which may be pushed to the device, 3GPP TS 23.041 Technical realization of CB (Section 9.5 Compression at CBE or CBC and opened at UE) and 3GPP TS 23.042 (CT1) Compression algorithm for text messaging services should be used to compress the polygon coordinates and message at the CBC, after which the appropriate cell towers are identified to broadcast the alert, and then decompress the alert message at the UE/device. Supported by 3GPP standards, changes to WEA could be achieved in 30 months.[15]

While inclusion of the polygon coordinates will reduce available characters for the alert message, this is an acceptable tradeoff for Public Safety.[16] The mix of polygon coordinates vs text message could be divided based on the desires of the alert originator. For example, the first 270 characters could be allocated for the WEA text message and the remaining 90 characters for polygon coordinates.

Leveraging the existing research and the work already completed as evidenced by the existence of 3GPP standards, the time needed to make the improvements to enhance the geo-targeting of WEA can be greatly accelerated. Also, since expanding capacity of WEA to 360 characters will enhance the ability to leverage the device for geo-targeting, we encourage the FCC to consider the time to implementation of device-based geo-targeting be set to the same time frame as upgrading to 360 characters, which is 30 Months from November 1, 2016.

f. CSRIC V Device Assisted Recommendation and Timeframe for Deployment

In addition to a multitude of filings from Public Safety, studies from several academic organizations, submissions from the technology community and standards already in existence for expanding to 360 characters and use of compression with cell broadcast, the final report from CSRIC V might provide the most significant and compelling endorsement of a device-assisted upgrade to WEA. The committee was comprised of leading public safety officials, wireless carriers, technology companies, and more. One of the main focuses of CSRIC V was the investigation of handset-enhanced, or device-assisted, WEA. The leadership of CSRIC V established a working group specifically tasked with reviewing the issue and adopting recommendations, if possible, that would be brought before the entire group. That goal was accomplished. Recommendation 3 and its established timeline is the product. In particular, Recommendation 3 called on the

[15] Members of CSRIC V (Mark D. Annas, Benjamin J. Krakauer, Brian Murray, Jonathan Gaddy, William H. McClendon and Mark A. Lucero) filing response to ATIS Feasibility on Device Based dated September 16, 2016.

[16] Members of CSRIC V (Mark D. Annas, Benjamin J. Krakauer, Brian Murray, Jonathan Gaddy, William H. McClendon and Mark A. Lucero) filing response to ATIS Feasibility on Device Based dated September 16, 2016.

FCC to work with public safety and technology representatives to "conduct research, develop standards and implement systems that support enhanced geo-targeting." A specific timeframe was established for completion of that task:

RECOMMENDATION 3 TIMELINE

This should be completed within up to 18 months of an FCC Report and Order on this document with a full outline of issues developed and presented to the key stakeholders, including the FCC, within 6 months of commencement of work. Once the standards work is complete, full system deployment including new handsets should be deployed within no more than 24 months.

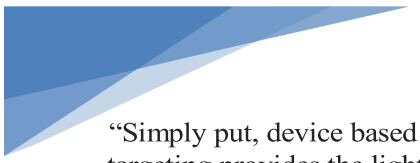
After numerous meetings, multiple submissions, and debates and discussions among the members of the working group, a consensus document and set of recommendations were developed and presented to the full committee in early September of this year. After some moderate changes to the proposal, the package in its entirety was adopted unanimously by the full CSRIC V committee. Recommendation 3 established a timeframe for development and deployment of a device-assisted solution.

Francisco Sanchez, Liaison to the Director & Public Information Officer, Harris County Office of Homeland Security, chair of CSRIC V and co-chair of the working group that focused on improved geo-targeting, filed an *ex parte* letter with the Commission detailing his thoughts about the efforts and product of the working group. Mr. Sanchez stated that "the recommendations concerning device assisted geo-targeting in *Wireless Emergency Alerts – Recommendations to Improve Geo-Targeting and Offer Many-to-One Capabilities,* Recommendation 3 in particular, are the most important and timely changes to WEA under consideration."[17] He believed that "Recommendations 3 was discussed and agreed on by the working group to be action-oriented, with the robust timeframe for deployment on handsets provided by the carriers and ATIS members[, and that the] expectation was that the coordinated efforts discussed in Recommendation 3 would be part of the development and deployment process to ensure an enhanced solution would be in my handset in 42 months."[18]

[17] *Ex Parte* Letter from Francesco Sanchez, Wireless Emergency Alerts Proceeding 15-91 (September 15, 2016).

[18] *Id.*

Additionally, a September 21st *ex parte* from Michael Gerber, Physical Scientist, Office of Dissemination NOAA/National Weather Service, also memorializes the CSRIC V effort, and further confirms the thoughts of Public Safety members of the working group regarding timing for deployment of device-assisted enhancements:



"Simply put, device based geo-targeting provides the lightest lift with the biggest return. The ability to precisely target at-risk populations will minimize disruption, reduce demands on the network, and give emergency managers and other alert originators the confidence to use WEA as the WARN Act intended."

> As a member of the CSRIC V, we co-authored the Working Group 2 Recommendations to Improve Geo-Targeting, including Recommendation #3, which specifically calls for deployment of these device assisted enhancements within 42 months of a Report and Order. We urge the Commission to incorporate these recommendations in the upcoming WEA Report and Order.
>
> The enhancements recommended in CSRIC V, including Recommendation #3, are necessary to personalize the threat so that people take life-saving action in response to WEA and improve overall public safety. In Filing #109162556128294 on September 16, 2016, five representatives of the public safety community said they "implore the Bureau and the Commissioners to include ALL OF the CSRIC recommendations as part of the upcoming order, including the recommendations regarding the incorporation of a handset enhanced WEA capability."[19]

As the multitude of comments in the record (and detailed above) from Public Safety officials suggest, CSRIC's development and adoption of a recommendation and timeframe for deployment of a handset-enhanced solution is a fundamental element of an improved WEA service.

[19] *Ex Parte* Filing from Michael E. Gerber, Wireless Emergency Alerts Proceeding 15-91 (September 21, 2016).

3. CONSUMER, ALERT-ORIGINATOR, AND WIRLESS PROVIDER BENEFITS OF INCORPORATING A DEVICE-BASED CAPABILITY INTO THE WEA SERVICE

a. Introduction

As the Commission considers an update to the WEA program, AC&C LLC believes that the incorporation of the intelligence in wireless devices into the WEA service can help drive continuous improvement in the service and unleash a wide-range of consumer, alert-originator, and wireless carrier benefits. As the record indicates, by combining the distribution of cell broadcast (and whatever future network enhancements the carriers adopt) with the capabilities of the mobile devices, we can create the geo-fenced mass notification system that public safety is calling for throughout the record.[20] At the same time, we can create a system that will evolve with new mediums and technological advancements, including the enhancements that are under investigation as part of the evolution of the 911 system. Finally, these enhancements will allow carriers to create a wide range of commercial offerings that will help drive continued innovation and investment into the WEA service.

These proposed changes are a very low cost solution that will not be a burden to the carriers currently providing the platforms for WEA delivery, nor to potential new carrier participants, but will provide additional capabilities and enhancements to alert originators, and will significantly enhance the likelihood that citizens that receive alert messages are those that were intended to receive the message.

b. Device-Based WEA Benefits to Consumers

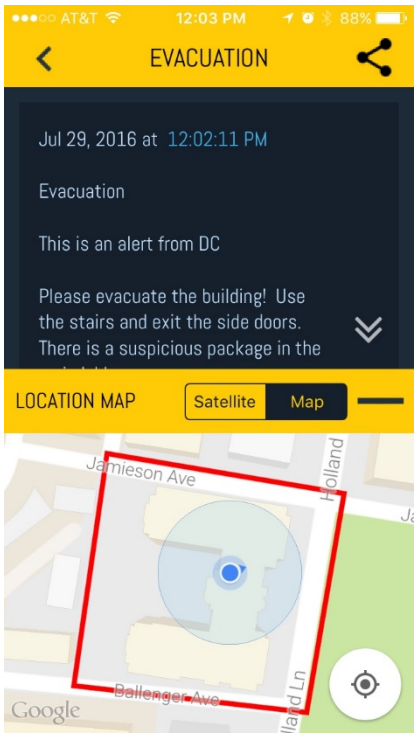
Device based alerting leverages the key components of Cell-Broadcast technology [unlimited communication capacity within the broadcast area, no databases and one way broadcast protecting privacy] to push information into the general alert area and the device's location awareness to decide **Who** the alert is relevant for and **How** the alert is displayed on the device. By passing the alert area coordinates generated by the public safety alert originator to the device along with the alert message, the device can compare its physical location to the alert area coordinates and play the message only when it is within the alert area. Once the device realizes the alert is relevant to its location it then decides how the person wants the message displayed. The device personalizes a mass notification by:

- confirming why the person is receiving the alert by showing the devices position within the polygon on a well-defined active map;

[20] "The FCC should require carriers to use integrated the Global Positioning System (GPS) capability in most new phones to allow for a greater pin-pointing of geo-targeted warnings. The nature of cell broadcast allows for a great amount of over-warning, however if warnings could be tailored so that a device is able to choose to display a warning, or not do so, based on the combination of the warning polygon and the devices GPS coordinates, it may allow for more targeted warning. In situations such as hazardous chemical releases, where protective actions are differentiated based on proximity and direction of the hazard, this could ensure that the right message reaches the right person, at the right time." City of Houston Comments at page 3.

- displaying the message in the preferred language of the device user if it is available;
- following the instructions set in the device to convert the text to speech, vibrate and flash;
- allowing the user to access additional detailed instructions for what to do during a tornado, flash flood, hurricane, etc. already stored on the device; and,
- as a "receive only" broadcast, device settings and user defined information can be leveraged to further personalize a message without extracting any information from device, thus protecting the privacy of the end user.

Here is an example of personalized device based WEA alert message: [Note: The blue dot marks the devices location.]



Since the alert area coordinates are contained in the data file with the message, the ability to geo-target is maintained using any delivery medium and evolves with the carriers chosen technology, including rapid deployed networks in the aftermath of natural and man-made disasters. The Common Alert Protocol (CAP) standard is designed to accommodate the broadcast of additional information, including geo-coordinates, to the device. Device-based enhancements are designed to integrate with current technologies being used by Public Safety and the wireless industry.[21]

[21] It is important to note that PGAlert is designed as "receive only", protecting the privacy of the end user.

c. **Device-Based WEA Benefits to Alert Originators**

The most significant benefit to Alert Originators will be the ability to contain alert messages to their jurisdiction, regardless of size. With the ability to contain the message to their jurisdictional footprint, there will be no need to require authorization from overlapping jurisdictions to send an alert. This will make the system feasible for jurisdictions of any size (buildings or college campuses), and:

1) Will create the opportunity for public-private partnerships that will generate revenue for WEA participants and will lead to a continual evolution of the WEA service and participation by all wireless providers;[22]

2) Will allow for much more significant geographic-targeting capability, resulting in alerting those people to whom the alert is relevant;[23]

3) Will address the desire of alert originators to provide additional information by allowing for a significant amount of information to be imbedded in the device, thereby often removing the need for alert originators to imbed links into the alert and, as a result, limiting the impact on the wireless networks;[24]

4) Will adapt to incorporate consumers' personal preferences into the alert – language of choice, font size, etc. – and because device-based works with cell broadcast and is a one way message, it protects the users privacy;

5) And, may significantly improve performance in the aftermath of natural or man-made disasters as wireless carriers evolve their networks, focus fuel resources on certain towers, or deploy COWs/COLTs. Device-based capability will allow for geo-targeting even as cell site configuration evolves and the possibility for over-alerting may increase;

a) **Device-Based WEA Benefits to Wireless Carriers**

A device-based WEA update will create the opportunity for public-private partnerships that will generate revenue for WEA participants and will lead to a continual evolution of

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[22]CELLULAR EMERGENCY ALERT SERVICE ASSOCIATION of Civil Societies: While the association accepts the terms of the WARN Act, that to imposition 'user' costs on alert and warning would limit participation, providing Government Information advisories should not be held to this this restriction. It is our comment that consideration be given to the expansion of WENS as a revenue-driven mobile feature.

[23] APCO: "APCO understands that the ability to geo-target wireless messages can be affected by network topology, geography, and radiofrequency behavior. But to be as clear as possible, geo-targeting saves lives. Accordingly, APCO encourages the wireless industry to apply available wireless network and device technologies to target messages as precisely as possible.

[24] AC&C Comments filed 1/13/16 page 8. Another suggestion is storing pre-formatted common messages on the device that can be retrieved with limited character codes. An example of this is working with the START (Study of Terrorism and Responses to Terrorism) group to put together the best wording for what to do during a tornado, flash flood, etc. to convey the clearest message. These files are then stored on the device, which can be updated and additional files added to the devices with normal software updates.

the WEA service and participation by all wireless providers;[25] The enhanced capabilities to personalize mass notifications will create opportunities to monetize cell broadcast and drive innovation that will generate continuous improvement for the WEA system. The mass notification industry for North America was $1.7B for 2014 and is an emerging and rapidly growing industry expected to be a $3.4 billion industry in North America by 2019.[26]

In a September 29th *ex parte* filing from Mark Lucero, IPAWS Chief Engineer, National Continuity Programs at FEMA, when discussing the inclusion of URLs into WEA messages, he said "[t]he most prominent security concern is the availability of network resources in the event a URL is sent to a great number of recipients simultaneously. These concerns can be abated through the following methods – [i]mproved geotargeting – [b]y reducing the amount of over-alerting outside the designated polygon, the number of extraneous recipients who click the URL would be reduced."

CONCLUSION

The record in this proceeding, from the original NPRM more than 8 years ago, through the recent NPRM and now the current FNPRM, Public Safety alert originators have called for improved geo-targeting of alerts. That call for change was echoed and enhanced more recently, as events in Orlando, Baton Rouge, Texas, New York, and now Tennessee have called for an alerting capability that can match the need to target alerts with the capability to do just that. As the record suggests, an enhancement exists that will address the concerns of Public Safety, significantly enhance the WEA service so that it delivers on its immense promise, and yet be low cost to wireless carriers while opening the door for a revenue generating capability. By working together, on the timeframe already established by CSRIC V, industry and Public Safety officials can make the necessary changes to standards, software and devices that will result in an enhanced public alert system capable of meeting Public Safety's needs. As Commissioner Pai has stated, "it is "time to be more forward leaning."

[25]CELLULAR EMERGENCY ALERT SERVICE ASSOCIATION of Civil Societies: While the association accepts the terms of the WARN Act, that to imposition 'user' costs on alert and warning would limit participation, providing Government Information advisories should not be held to this this restriction. It is our comment that consideration be given to the expansion of WENS as a revenue-driven mobile feature.

[26] Business Wire, May 26, 2015 Research and Markets; North America Mass Notification System Market…